Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. **(currently amended):** A semiconductor wafer cleaning system, comprising:

a cleaning chamber;

a wafer support disposed within said chamber and configured to support a plurality of wafers within said chamber as spaced from one another in a first direction;

a source of cleaning solution associated with said cleaning chamber such that said cleaning chamber can be filled with cleaning solution from said source;

a source of de-ionized water;

de-ionized water supply nozzles ~~connected~~, and piping connecting said deionized water supply nozzles to said source of de-ionized water ~~and oriented to spray deionized water from said source thereof into said chamber towards wafers supported by said wafer support~~,

each of the de-ionized water supply nozzles having a main body in the form of a pipe defining an inner nozzle passageway, and a plurality of sets of nozzle holes ~~connected to~~ extending from the inner nozzle passageway, the main bodies of said de-ionized water supply nozzles extending longitudinally in said first direction at opposites sides of said wafer support, the nozzle holes of each said set lying in a plane ~~perpendicular to~~ that intersects said first direction, only five respective ones of said nozzle holes lying in each said plane, and said sets of nozzle holes being spaced from each other along the length of the main body, and

each said set of [[said]] five nozzle holes subtending an angle of 80~100° about the inner nozzle passageway from which the set of nozzle holes extends, and each of said nozzles holes being oriented to spray deionized water from said source thereof towards wafers supported by said wafer support in the chamber so that the de-ionized water is sprayed through each said set of nozzle holes over a range of 80~100°, as measured in the circumferential direction of the main body of the nozzle, towards wafers supported by said wafer support in the chamber;

a discharge section including at least one discharge pipe connected to a lower part of said cleaning chamber, and an overflow tank surrounding an upper part of said cleaning chamber; and

control means for controlling the rates at which de-ionized water is fed through said de-ionized water supply nozzles and at which fluid in said chamber is discharged via said discharge section.

2. **(canceled)**

3. **(original):** The system of claim 1, wherein the inner nozzle passageway of each said de-ionized water supply nozzle has a diameter thereof of 0.8±0.05㎜, and the nozzle holes each have a diameter of 0.5~±0.05㎜.

4. **(original):** The system of claim 1, wherein the discharge section includes at least two discharge pipes connected to a lower part of said cleaning chamber at locations spaced from one another in said first direction.

5. **(withdrawn):** A method of cleaning semiconductor wafers, comprising:

filling a cleaning chamber with a cleaning solution;

washing a plurality of wafers by submerging the wafers in the cleaning solution within the cleaning chamber with the wafers being oriented vertically

and spaced from each other in a first direction;

subsequently rinsing the vertically oriented wafers within the cleaning chamber by supplying de-ionized water to de-ionized water spray nozzles having nozzle holes directed towards respective vertically oriented surfaces of the wafer, and thereby spraying the de-ionized water into the cleaning chamber and onto the surfaces of the wafers within the chamber;

continuing the spraying of the de-ionized water into the cleaning chamber such that liquid in the cleaning chamber begins to overflow the cleaning chamber;

draining the liquid in the cleaning chamber from a lower part of the cleaning chamber as the de-ionized water is sprayed into the cleaning chamber, and the liquid overflows the cleaning chamber; and

controlling the supplying of the de-ionized water to the de-ionized water spray nozzles and said draining of said liquid such that liquid in an amount of 92-97 weight% of the de-ionized water that is being supplied by the nozzles into the cleaning chamber is simultaneously discharged from the cleaning chamber through the lower part of the cleaning chamber 30, while liquid in an amount of 3-8 weight% of the de-ionized water that is being supplied by the nozzles is simultaneously discharged as overflowing the cleaning chamber, all while the wafers remain within the cleaning chamber.

6. **(withdrawn):** The method of claim 5, wherein said controlling the supplying of the de-ionized water to the de-ionized water spray nozzles comprises regulating the flow of de-ionized water through said nozzles to a rate of 21~26 l/min.

7. **(withdrawn):** The method as claimed in claim 5, wherein said spraying of the de-ionized water into the cleaning chamber comprises spraying the water onto the surfaces of the over a range of 80~100° in a vertical plane in which each of said surfaces lies.

8. **(withdrawn):** The method as claimed in claim 6, wherein said spraying of the de-ionized water into the cleaning chamber comprises spraying the water onto the surfaces of the over a range of 80~100° in a vertical plane in which each of said surfaces lies.

9. **(withdrawn):** The method as claimed in claim 5, wherein said discharging of the de-ionized water form the lower part of the leaning chamber is carried out at at least two locations aligned in said first direction in which the wafers W are spaced from each other.

10. **(canceled)**.

11. **(new):** The system of claim 1, having only two said deionized water nozzles, and wherein the deionized water nozzles are disposed at opposite sides, respectively, of an upper portion of the cleaning chamber, the nozzle holes extend from the inner nozzle passageways of the deionized water nozzles with a downward inclination toward vertical lines which bisect the wafer support at locations, respectively, where the wafer support is configured to support the wafers in the chamber such that deionized water issues from each of the nozzle holes as a stream flowing with a downward inclination towards a wafer supported by said wafer support in the chamber.

12. **(new):** The system of claim 11, wherein said controller is configured to control the supplying of the de-ionized water to said cleaning chamber via the de-ionized water supply nozzles and to control the discharging of liquid via the at least one discharge pipe such that liquid in an amount of 92-97 weight% of the de-ionized water that is being supplied by the nozzles into the cleaning chamber is simultaneously discharged from the cleaning chamber, while liquid in an amount of 3-8 weight% of the de-ionized water that is being

supplied by the nozzles is simultaneously discharged as overflowing the cleaning chamber.

13. **(new):** The system of claim 1, wherein said controller is configured to control the supplying of the de-ionized water to said cleaning chamber via the de-ionized water supply nozzles and to control the discharging of liquid via the at least one discharge pipe such that liquid in an amount of 92-97 weight% of the de-ionized water that is being supplied by the nozzles into the cleaning chamber is simultaneously discharged from the cleaning chamber, while liquid in an amount of 3-8 weight% of the de-ionized water that is being supplied by the nozzles is simultaneously discharged as overflowing the cleaning chamber.

14. **(new):** The system as claimed in claim 1, wherein the source of cleaning solution is connected to the cleaning chamber via the at least one discharge pipe.

15. **(new):** A semiconductor wafer cleaning system, comprising:

a cleaning chamber;

a wafer support disposed within said chamber and configured to support a plurality of wafers within said chamber as spaced from one another in a first direction;

a source of cleaning solution associated with said cleaning chamber such that said cleaning chamber can be filled with cleaning solution from said source;

a source of de-ionized water;

de-ionized water supply nozzles, and piping connecting said deionized water supply nozzles to said source of de-ionized water,

each of the de-ionized water supply nozzles having a main body in the form of a pipe defining an inner nozzle passageway, and a plurality of sets of nozzle holes extending from the inner nozzle passageway, the main bodies of

said de-ionized water supply nozzles extending longitudinally in said first direction at opposites sides of said wafer support, the nozzle holes of each said set lying in a plane that intersects said first direction, and said sets of nozzle holes being spaced from each other along the length of the main body, and

each said set of said nozzle holes subtending an angle of 80~100° about the inner nozzle passageway from which the set of nozzle holes extends, and each of said nozzles holes being oriented to spray deionized water from said source thereof towards wafers supported by said wafer support in the chamber so that the de-ionized water is sprayed through each said set of nozzle holes over a range of 80~100°, as measured in the circumferential direction of the main body of the nozzle, towards wafers supported by said wafer support in the chamber;

a discharge section including at least one discharge pipe connected to a lower part of said cleaning chamber, and an overflow tank surrounding an upper part of said cleaning chamber; and

control means operatively connected to the de-ionized water supply nozzles and to the discharge section and configured to control the supplying of the de-ionized water to said cleaning chamber via the de-ionized water supply nozzles and to control the discharging of liquid via the at least one discharge pipe such that liquid in an amount of 92-97 weight% of the de-ionized water that is being supplied by the nozzles into the cleaning chamber is simultaneously discharged from the cleaning chamber, while liquid in an amount of 3-8 weight% of the de-ionized water that is being supplied by the nozzles is simultaneously discharged as overflowing the cleaning chamber.

16. **(new):** The system of claim 15, having only two said deionized water nozzles, and wherein the deionized water nozzles are disposed at opposite sides, respectively, of an upper portion of the cleaning chamber, the nozzle holes extend from the inner nozzle passageways of the deionized water nozzles with a downward inclination toward vertical lines which bisect the

wafer support at locations, respectively, where the wafer support is configured to support the wafers in the chamber such that deionized water issues from each of the nozzle holes as a stream flowing with a downward inclination towards a wafer supported by said wafer support in the chamber.

17. **(new):** The system as claimed in claim 15, wherein the source of cleaning solution is connected to the cleaning chamber via the at least one discharge pipe.